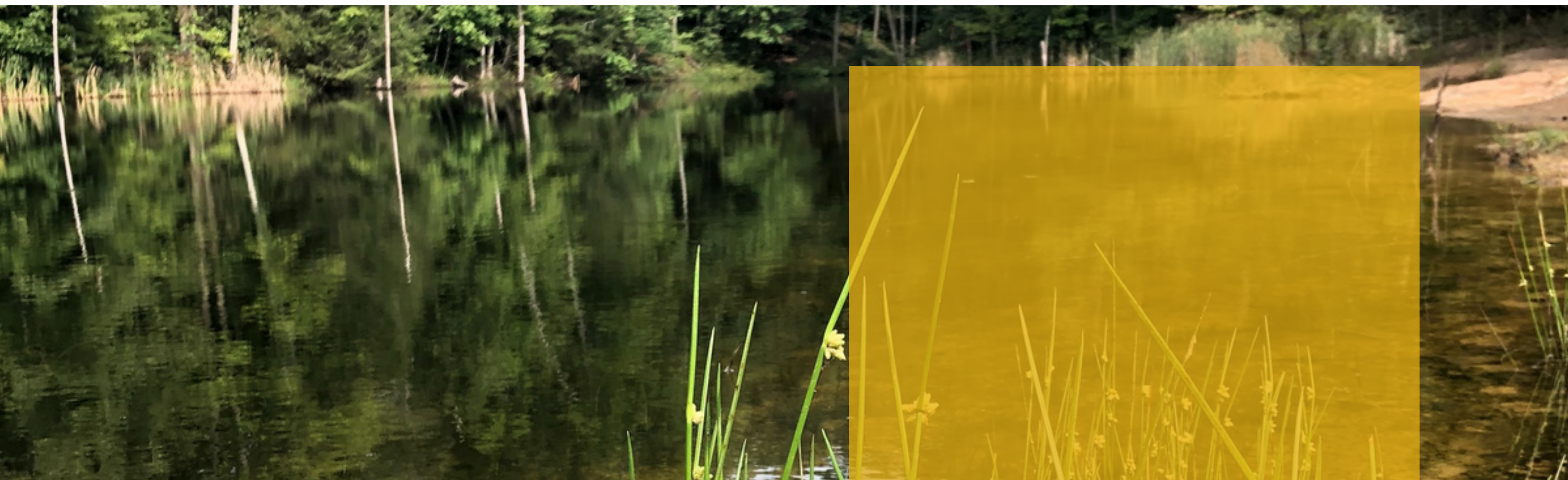
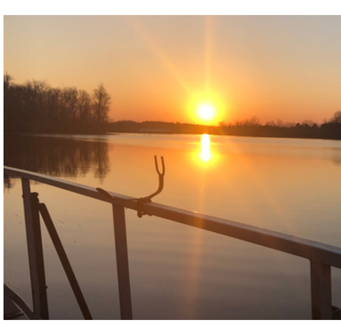
VOL. 41 ISSUE 1 | AUGUST 2023

THE LOTUS

Midsouth Aquatic Plant Management Society Newsletter



THIS ISSUE:



Letter from the President

Greetings Members,

Wishing you all are well and have been able to not get too hot this Summer! Hopefully, things are soon to cool off and we will not be too busy to enjoy it - Summer is soon to be over for some and for others about to hotter!

I would like to invite you all to join us in a couple months to the 2023 MidSouth Aquatic Plant Management Society conference Tuesday, October 24 through Thursday October 26, 2023 in LaGrange, Georgia. We have a great slate of speakers lined up to go over the newest information in the region.

We are looking forward to having another great meeting this year and I know that it is possible with our members, vendors, and BOD's. Thank you for all your continued support and attendance!

See you in October!

Carl Della Torre

MidSouth APMS President

Board of Directors Update

Your current MSAPMS BOD is:

President
Carl Della Torre
Orion IVM Solutions

President Elect
Daniel Hill
Southeast Vegetation Management

Past President
JJ Ferris
Cygnet Enterprises

Secretary
Gray Turnage
Mississippi State University

Treasurer
Derek Smith
Aqua Services, a Jones Fish company

Editor
Adam Charlton
Aquatic Control Inc.

Director
Dean Jones
UPL

Director
Harry Knight

Director
Tim McClean
Alabama Power

Director
Stephen Turner
TVA

Board of Directors Slate

Your 2023 MSAPMS BOD slate is:

We will be voting on this at the upcoming meeting in October

President Elect - Dr. Gray Turnage

Secretary - Dr. John Madsen

Director - Matt Horton

Director - Matt Townson

Knotgrass *(Paspalum distichum*) control to Improve Waterfowl Habitat in Mississippi

Gray Turnage

Assistant Research/Extension Professor, Mississippi State University, GeoSystems Research Institute

BACKGROUND

Many aquatic and wetland grasses can survive a broad range of environmental conditions and disturbance events making them particularly difficult to control in areas managed for waterfowl habitat by seasonal drawdown. Knotgrass (*Paspalum distichum L.*) is a native grass in the United States that is capable of excluding other aquatic plants that may be preferred waterfowl forage. Knotgrass is also a weed in citrus orchards and agronomic crops, particularly rice fields. Knotgrass populations have been linked to livestock and human disease vectors by providing habitat for livestock pathogens and disease carrying organisms like mosquitoes. Knotgrass spread has been documented via human activities and by mammals and waterfowl feeding on the inflorescences and excreting viable seeds at new locations. In addition to sexual reproduction and spread, vegetative spread occurs as knotgrass stem nodes will readily sprout in a variety of light, temperature, and moisture regimes. Knotgrass can rapidly outcompete many plant species in aquatic habitats around the globe which can negatively affect biodiversity of aquatic fauna relying on other aquatic flora for resources. A diverse floral community is preferred by waterfowl resource managers in order to sustain greater waterfowl diversity and larger waterfowl populations. Muscadine Farms Wildlife Management Area (MFWMA) near Greenville, MS in the Mississippi flyway is a series of manmade ponds that are each 15-20 acres in size covering approximately 2,000 ac of land. Most ponds are drawn down annually so resource managers can utilize machinery to manage non-native vegetation and establish supplemental waterfowl forage like millet and corn. In recent years, knotgrass has become a dominant species in the system (Figure 1) and displaced a diverse native plant community in many of the ponds with dense knotgrass monocultures (Figure 2).

Knotgrass is consumed by some species of waterfowl, but it is not a preferred forage species at MFWMA as there are other plant species with greater rates of productivity that can support larger waterfowl numbers, therefore, knotgrass reduction was needed to open habitat for other plant species. A number of chemical control techniques for knotgrass have been documented with ALS inhibiting herbicides being among the most studied. Unfortunately, most of the previously studied ALS herbicides are not labeled for general aquatic use in the U.S. but there are other ALS inhibiting herbicides (bispyribac-sodium, imazapyr, imazamox, and penoxsulam) that are legal for use. The purpose of this project was to assess short term control of knotgrass reduction by aquatic use labeled ALS inhibiting herbicides as stand-alone control methods.

METHODOLOGY

This project was conducted at MFWMA and repeated 2 weeks later. A total of 5 treatments were administered: a non-treated reference and four herbicide applications. Prior to applying herbicide treatments, pre-treatment samples were collected from each plot by recording knotgrass plant height and percent cover then placing a 0.1 m2 PVC frame on the ground in the plot and removing all aboveground knotgrass biomass within the frame. Knotgrass biomass was dried in a forced air oven at 70C for 5 days, then biomass weights were measured and recorded.

Treatments were randomly assigned to treatment plots 30 ft X 30 ft in size; each treatment was replicated four times per trial. Herbicide treatments were applied as a foliar spray using an ATV sprayer outfitted with a boomless nozzle (spray swath of 30 ft) and applied at a target carrier volume of 50 gal/ac. Herbicide treatments were imazapyr (Habitat; 3 pts/ac), glyphosate (Roundup Custom; 4 pts/ac), imazamox (Top Deck; 4 pts/ac), and penoxsulam (Galleon SC; 2.8 oz/ac); each herbicide treatment included 0.5% v:v methylated seed oil to enhance herbicide uptake by plants. At 12 weeks after treatment (WAT), plant height and percent cover were recorded in each plot, and biomass was collected at three points in each plot in the same manner as pre-treatment specimens. Plant community data was also assessed to determine which species were recolonizing treated sites (data not presented). A final data collection and harvest event will occur in the summer of 2023 to collect 52 WAT data.

An ANOVA procedure was used to detect differences in treatment means and if differences were detected, a Fishers Least Significant Difference test was used to separate treatment means at the alpha = 0.05 significance level.

CONCLUSIONS

Knotgrass height was reduced 58 to 70% (Figure 3), percent cover was reduced 69 to 88% (Figure 3), and biomass was reduced 70 to 88% (Figure 4) by all herbicide treatments 12 WAT when compared to non-treated reference plants. There was no difference in height, percent cover, or biomass reduction among herbicide only treatments 12 WAT (Figures 3 and 4) and most herbicide treatments suppressed knotgrass near or below pre-treatment levels. Many sites (except imazapyr treated sites) were being re-colonized by members of the polygonum (smartweeds) and cyperus (flat sedges; Figure 5) species; both of which contain species that produce prolific amounts of seed consumed by waterfowl.

This work provides evidence that ALS inhibiting herbicides labeled for general aquatic use in the United States can be used for short term knotgrass reduction; however, long term results will give a better understanding of the role of these herbicides for future knotgrass management. Long term data is a critical need before these herbicides can be recommended for operational knotgrass management and will be collected in the summer of 2023 (52 WAT). Future work is planned to assess these herbicides on knotgrass in flooded conditions, the efficacy of other herbicide modes of action on knotgrass, as well as integration of herbicides with other control techniques like mowing, disking, or prescribed fire for knotgrass reduction.

FIGURES

Figure 1. Drawn down 15 ac waterfowl pond infested with knotgrass (*Paspalum distichum*).

Figure 2. Image showing density of knotgrass stems and leaves.

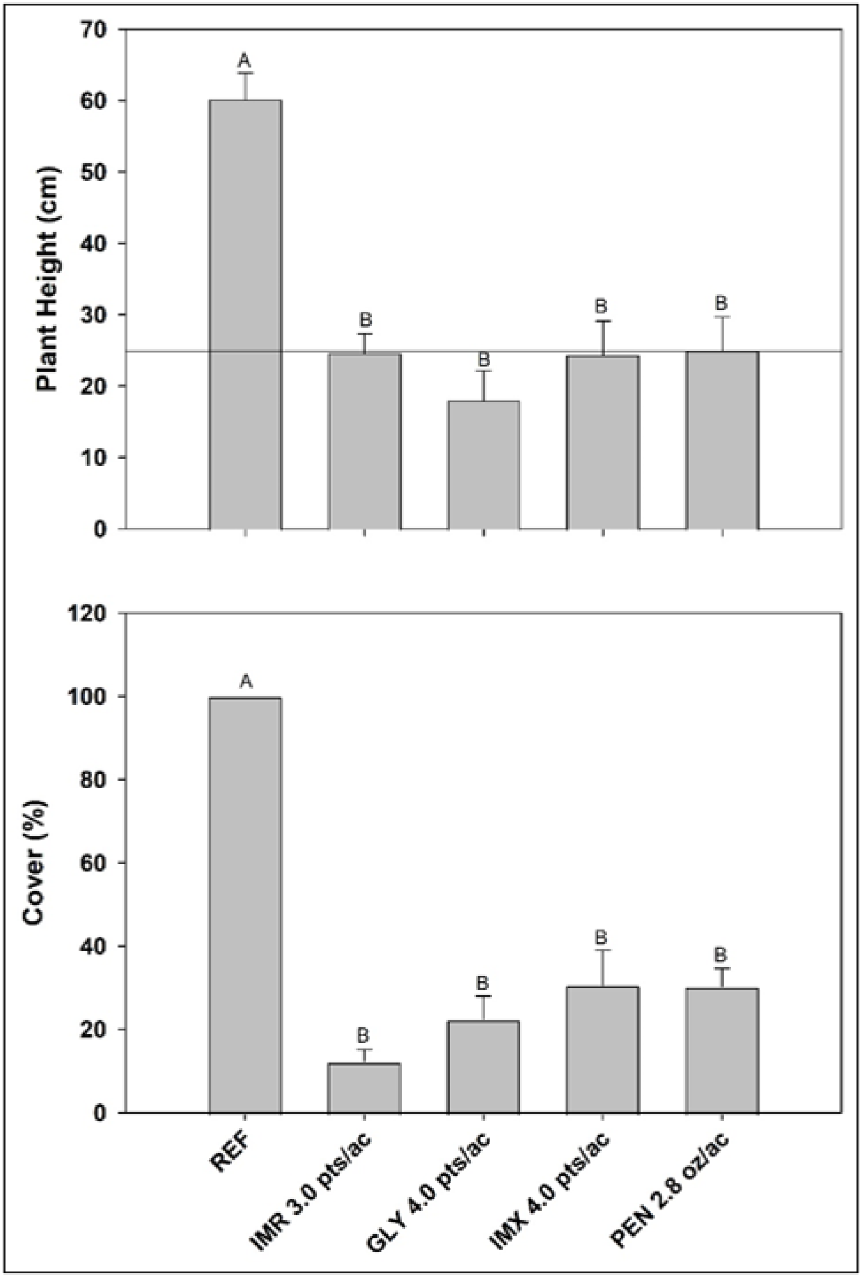


Figure 3. Knotgrass (Paspalum distichum L.) height and percent cover 12 weeks after treatment with systemic herbicides; bars sharing the same letter are not different at the alpha = 0.05 significance level (n=8); in the upper panel, the solid line is pre-treatment height; along the x-axis, IMR is imazapyr, GLY is glyphosate, IMX is imazamox, and PEN is penoxsulam.

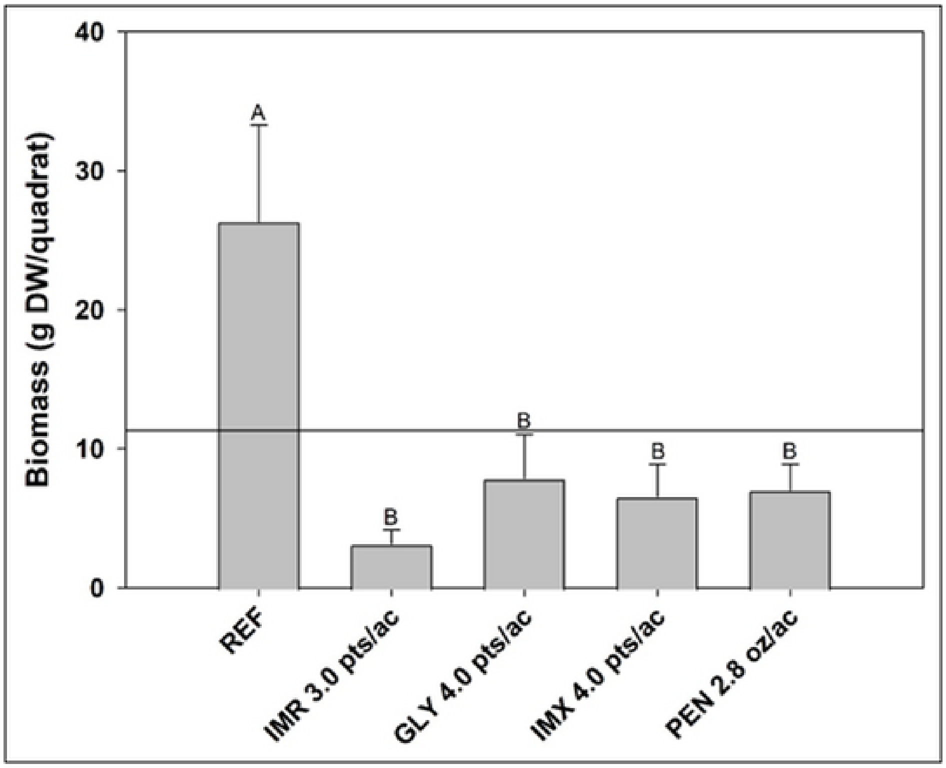


Figure 4. Knotgrass (Paspalum distichum L.) biomass 12 weeks after treatment with systemic herbicides; bars sharing the same letter are not different at the alpha = 0.05 significance level (n=8); the solid line is pre-treatment biomass; along the x-axis, IMR is imazapyr, GLY is glyphosate, IMX is imazamox, and PEN is penoxsulam.

Figure 5. Herbicide treated plot re-colonized by flat sedges (Cyperus spp.) and smartweed (Polygonum spp.).

2022

Conference

MOBILE

October 24-26, 2022
Battle House Rennaissance, Mobile, AL

We had a blast on the delta! Mobile was a great place to hold our conference.

2022

Conference Awards

Wes Anderson (left) recognized for his service as past-President of MSAPMS.

Dean Jones (left) recognized for his service as Director.

2022

Conference Awards

Stephen Turner (left) recognized for his service as Director.

Sam Schmid (left) was awarded the 2022 Student Scholarship award.

2022

Conference Awards

Sherry Whitacre (right) awarded the Honorary Member award.

Sam Schmid (third from left) awarded the 2022 student scholarship award. Other student scholarship award recipients included: Joey Kauppi (second from left), MacKenzie Lee (fourth from left), and Phillip Wittman (second from right).

2022

Conference Awards

Carl Della Torre (left) awarded the President's Award.

42nd Annual Mid-South Aquatic Plant Management Conference

Del'Avant Event Center

141 Main Street

LaGrange, GA

October 24-26, 2023

Early registration ends Sept. 23

To register for the conference and reserve hotel rooms visit our new website

https://www.msapms.org/

Student Spotlight

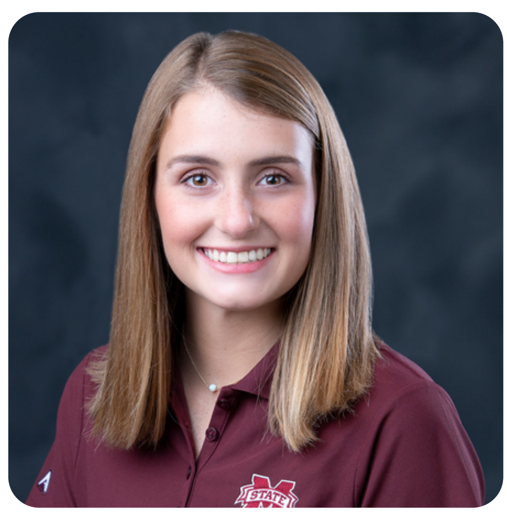
MacKenzie Lee

School: Mississippi State University

Aquatic nuisance plants (ANS) can negatively affect water chemistry, ecological processes, biodiversity, and human uses of water resources. One such ANS, watershield (Brasenia schreberi), can be problematic in water bodies of the southeastern U.S. if not properly managed. Chemical control measures for this plant are minimal, thus, resource managers and landowners have limited options for managing this species. The goal of this research was to assess the prevalence of watershield in Mississippi waterbodies along with the efficacy of submersed injections of a protoporphyrinogen-oxidase (PPO) inhibiting herbicide, flumioxazin, for control of water shield. A series of mesocosm and field trials were conducted to assess rate reductions of submersed flumioxazin injections for watershield control. Mesocosm data suggested flumioxazin applications above a quarter of the maximum label rate (100 ppb) reduced water shield biomass by >70% 8 weeks after treatment (WAT) compared to non-treated plants. Submersed applications of flumioxazin (100 ppb) to a field population reduced watershield leaf density 88% and biomass 99% compared to non-treated plants 8 WAT. In 2022, 21 lakes in south Mississippi were surveyed for watershield presence. Watershield prevalence was not correlated to depth or diversity suggesting water clarity and plant community composition are not drivers of watershield prevalence. However, plant diversity was positively correlated to littoral depth of lakes suggesting lakes with greater water clarity can support more diverse plant communities. This project identified a new control measure for management of nuisance watershield populations giving Mississippi resource managers and landowners a new management option for this species.

Hometown: Carthage, MS
Hobbies: Fishing, kayaking, traveling, shopping
Career goals: Conserving and restoring our environment by pursuing a career with the United States Dept. of Agriculture

Look for MacKenzie at the 2023 MSAPMS conference in October and ask her about her research!



Thank you to our sponsors!